

- 1 1. An apparatus for removal of contaminants from remote surfaces comprising:
2 an elongate delivery tube having a lumen extending therethrough and having a
3 first end and a second end connectable to a source of high pressured fluid to allow fluid
4 communication with the delivery tube lumen;
5 a nozzle operatively coupled to the first end of the delivery tube, the nozzle
6 having at least one orifice in fluid communication with the delivery tube lumen; and
7 means for positioning the nozzle in the proximity of the contaminants.
- 1 2. The apparatus of claim 1 wherein the means for positioning the nozzle
2 comprises:
3 an elongate guide tube having a lumen extending therethrough; and
4 wherein the elongate delivery tube is disposed within the lumen of the guide
5 tube.
- 1 3. The apparatus of claim 2 wherein the elongate guide tube extends along a main
2 axis and has a distal portion thereof with a bend radius that deviates from the main axis
3 of the guide tube by an off axis angle.
- 1 4. The apparatus of claim 3 wherein the distal portion of the guide tube deviates
2 from the main axis of the guide tube by an off axis angle of between 0 degrees and 180
3 degrees.
- 1 5. The apparatus of claim 1 wherein the means for positioning the nozzle
2 comprises:
3 an elongate positioning member; and
4 means for securing the positioning member to the elongate delivery tube.
- 1 6. The apparatus of claim 1 further comprising:

2 an adapter mechanism having a lumen extending therethrough,
3 the adapter mechanism operatively coupled to the elongate delivery tube so that
4 the adapter mechanism lumen is in fluid communication with the lumen of the elongate
5 delivery tube.

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7 7. The apparatus of claim 6 further comprising:
8 a plurality of nozzles each operatively coupled to the adapter mechanism and in
9 fluid communication with the lumen of the elongate delivery tube.

1 8. The apparatus of claim 6 wherein the adapter mechanism has a substantially L-
2 shaped lumen extending therethrough.

1 9. The apparatus of claim 6 wherein the adapter mechanism has a substantially T-
2 shaped lumen extending therethrough.

1 10. The apparatus of claim 6 wherein the adapter mechanism is coupled
2 intermediate the elongate delivery tube and the nozzle.

1 11. The apparatus of claim 10 wherein the elongate delivery tube comprises a plurality
2 of sections and wherein the adapter mechanism is coupled intermediate a plurality of
3 elongate delivery tube sections.

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2 12. The apparatus of claim 1 in combination with a source of high pressure fluid
3 connected to the second end of the lumen of the elongate delivery tube.

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5 13. The apparatus of claim 3 further comprising:
6 any of a sensor, transducer, and imaging device carried at the distal end of the
7 elongate guide tube.

1 14. The apparatus of claim 1 in combination with a processing unit operatively
2 coupled to any of the sensor, transducer, and imaging device carried at the distal end of
3 the guide tube.

1 15. A method for removal of contaminants from remote surfaces comprising:

2 (a) providing the high pressure lancing apparatus comprising:

3 (i) an elongate delivery tube having a lumen extending therethrough and
4 having a first end and a second end connectable to a source of high pressure fluid so as
5 to allow fluid communication with the delivery tube lumen, the delivery tube having a
6 second end,

7 (ii) a nozzle operatively coupled to the first end of the delivery tube and
8 having at least one orifice in fluid communication with the lumen of the delivery tube,
9 and

10 (iii) means for positioning the nozzle;

11 (b) manipulating the means for positioning the nozzle so that the nozzle is
12 disposed in proximity of the contaminants;

13 (c) providing high pressure fluid from a source to the lumen of the elongate
14 delivery tube; and

15 (d) directing high pressure fluid emanating from the nozzle toward the
16 contaminants.

1 16. The method of claim 15 wherein the means for positioning the nozzle comprises
2 an elongate guide tube having a lumen extending therethrough and into which the
3 elongate delivery tube is disposed and wherein (b) comprises:

4 (b1) positioning a distal end of the guide tube in the proximity of the
5 contaminants; and

6 (b2) manipulating the elongate delivery tube within the lumen of the guide tube
7 so that the nozzle extends beyond the distal end of the guide tube.

1 17. The method of claim 15 wherein the means for positioning the nozzle comprises
2 an elongate positioning member secured to the elongate delivery tube and wherein (b)
3 comprises:

4 (b1) manipulating the elongate positioning member so that the nozzle is
5 disposed in proximity of the contaminants.

1 18. The method of claim 15 wherein the apparatus further comprises a sensor
2 carried near the first end of the elongate delivery tube and in communication with a
3 processing unit near the second end of the elongate delivery tube and wherein the
4 method further comprises:

5 (e) sensing a condition in the proximity of the nozzle; and

6 (f) transmitting signals associated with the condition from the sensor to the
7 processing unit.

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1 19. The method of claim 15 wherein the nozzle of the lancing apparatus has a
2 plurality of orifices and wherein (b) comprises:

3 (b1) directing high pressure fluid from one of the nozzle orifices in a direction
4 other than the toward the contaminants.

1 20. The method of claim 15 wherein the lancing apparatus further comprises a
2 plurality of nozzles operatively coupled to the elongate delivery tube and in fluid
3 communication with the lumen of the elongate delivery tube and wherein (b) comprises:

4 (b1) directing high pressure fluid from one of the nozzles in a direction
5 substantially opposite the direction from which high pressure fluid is emanating from
6 another of the plurality of nozzles.